

Amendments to the Specification

Before paragraph [0002], please add the following heading:

--BACKGROUND--.

Before paragraph [0004], please add the following heading:

--SUMMARY OF THE INVENTION--.

Please replace paragraph [0004] with the following amended paragraph:

[0004] The present invention addresses these problem points. On one hand, the grinding and the polishing and here, particularly, the corresponding correction passes are no longer controlled manually, ~~but by a method according to claim 1 and subsequent claims.~~ The present invention provides a method for grinding and polishing free-form surfaces using at least one tool, the method comprising: calculating a virtual removal of a preprocessed optical surface having an initial shape sufficient to achieve a desired shape; dividing the optical surface into a plurality of subareas; calculating a zeroth order approximation for estimating a mutual interaction for each adjacent subarea of the plurality of subareas; calculating a dwell time of the at least one tool for each of the plurality of subareas using a linear system of equations, the calculating taking into account the respective mutual interaction and at least one of a contact pressure, a speed of rotation, and a behavior of a polishing agent of the at least one tool; and controlling each of the at least one tool for each subarea so as to remove material from the optical surface in accordance with the virtual removal, wherein the controlling of the tool is performed by controlling at least one of the contact pressure, the speed of rotation, the dwell time, and a movement of the at least one tool. ~~On the other hand, the tools described in claim 23 and subsequent claims provide~~ The present invention also provides tools for achieving a considerably higher, but nonetheless exactly controllable and reproducible removal. The invention enables thus considerably lower production costs.

Please replace paragraph [0006] with the following amended paragraph:

[0006] ~~Subject~~ An object of the present invention is to avoid these disadvantages.

Please replace the heading after paragraph [0039] with the following amended heading:

~~Example of an embodiment:~~ BRIEF DESCRIPTION OF THE DRAWINGS

Please add the following new paragraphs [0039.1] through [0039.19] and heading before paragraph [0040]:

[0039.1] The present invention is described in more detail below with respect to an example and with reference to the drawings, which show:

[0039.2] Fig. 1: Arrangement of a round free-form surface (1) into areas (3) in case of application of the tool (2) with diameter 16 mm (top view onto the free-form surface);

[0039.3] Fig. 2: Arrangement of a rectangular free-form surface (4) into areas (3) which are delimited by area boundaries (5) which correspond to the size of the tool (2) (top view into the free-form surface);

[0039.4] Fig. 3: Two-dimensional error distribution (6) of a rotationally symmetric optical lens (asphere);

[0039.5] Fig. 4: Motion-sequences in case of the processing of a rotationally symmetric optical lens (1) with a (polishing) tool (2) (side view / sectional view);

[0039.6] Fig. 5: Radial intersection of the error distribution (7) on the rotationally symmetric optical lens from Fig. 4; this corresponds to the minimally necessary removal;

[0039.7] Fig. 6: Shifted radial intersection of the error distribution (13) on the rotationally symmetric optical lens from Fig. 4; this corresponds to the removal often realized hitherto;

[0039.8] Fig. 7: Illustration of the method with actual state of the surface's error (7), the forecasted removal (sum from 8 and 9) and the forecasted remaining error after the processing;

[0039.9] Fig. 8: The dwell times (11) determined by the method;

[0039.10] Fig. 9: The remaining error (12) on the surface processed with these dwell times (11);

[0039.11] Fig. 10: Exemplary distribution of areas (B1, ..., B9) overlapping to 50 % within a radial intersection of a rotationally symmetric surface;

[0039.12] Fig. 11: Proportions between tool and workpiece 1:8 and 1:4;

[0039.13] Fig. 12: Comparison of size between the narrowest error of the error distribution () and the tool (2);

[0039.14] Fig. 13: Tool with adapted polishing or grinding foil (14) with perpendicular edges (15);

[0039.15] Fig. 14: Arrangement of several tools (2) on the round free-form surface (1);

[0039.16] Fig. 15: Arrangement of several tools (2) on the rectangular free-form surface (4);

[0039.17] Fig. 16: Arrangement of several tools (2) which overlie the free-form surface (1) tangentially, i.e. with perpendicular orientation;

[0039.18] Fig. 17: Arrangement of round mechanical compounds (18) of tools (2) on a round free-form surface (1); and

[0039.19] Fig. 18: Arrangement of rod-shaped mechanical compounds (18) of tools (2) on a rectangular free-form surface (4).

--DETAILED DESCRIPTION--.

Please delete the heading "Description of the figures:" following paragraph [0048].

Please delete paragraphs [0049] through [0066].

Please delete the text on page 12, including the entire listing of "Numbers in the figures".